

Manual of a modified algorithm for creating a triangular graph in the ArcMap environment

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- The source code of both calculations (points and classification) has been modified to allow work with time (the calculation is repeated automatically)

Input file

- the decisive element of the calculation is the imported input file from Excel (or another spreadsheet), which will contain the input data for the calculation
- the data must have a three-part structure
- for the calculation to work properly, it is necessary to follow the specified header format, which is as follows:

NAME_SK	NUTS_ID	P_2010_1	P_2010_2	P_2010_3	P_2011_1	P_2011_2	P_2011_3	P_2012_1	P_2012_2	P_2012_3
Belgicko	BE	10	8	13	12	9	15	13	11	17
Bulharsko	BG	7	4	11	8	6	12	10	8	14
Cesko	CZ	9	6	12	10	7	13	11	9	15
Chorvatsko	HR	8	6	10	10	9	14	12	11	16
Dansko	DK	13	11	16	14	13	17	14	11	18
Estonsko	EE	9	7	13	12	8	15	14	10	17
Finsko	FI	15	12	19	16	14	20	18	15	22
Francuzsko	FR	14	10	17	16	12	19	17	14	21
Holandsko	NL	11	8	15	12	10	18	15	12	20

where: X_####_Y (napr. P_2010_1), means:

- X – letter specifying the beginning of the header for the calculation (choice of letter is arbitrary)
- #### – a number that describes the calculation period - it does not have to describe it unambiguously, it is for a user orientation
- Y – parameter name (alphanumeric character without special characters): the name must be unique for each parameter from the three-part data structure
- sign “_” – it is mandatory to preserve and serves as a separator of individual parts of the header

! the input file must also contain a link variable that correctly matches the input table with the polygon layer (e.g. NUTS_ID)

Calculation

- the data must be imported into the ArcMap environment and linked to the polygon layer using a link variable

1. Points

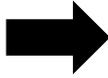
ArcMap input form for the first calculation step:

- Input layer – input layer (.shp) containing data for calculation
- Sheet name – the name of the sheet in Excel (most often Sheet1) imported into the attribute table of the input layer
- Name of first category – the name of first parameter in the header (e.g. 1)
- Name of second category – the name of second parameter in the header (e.g. 2)
- Name of third category – the name of third parameter in the header (e.g. 3)
- Reference category – category from the attribute table that will be assigned to the calculated values (e.g. NUTS_ID)
 - helps to clearly identify the calculated points (e.g. by territory), see the results
- Output point layer – the name and repository of the output layer, which should contain the calculated position of individual points for all periods
- Auxiliary lines (optional parameter) – the name and repository of the output layer, which should contain the calculated position of individual lines for all periods
- Base triangle (optional parameter) – the name and repository of the output layer, which should contain the base triangle (only one)

- Up to three layers can be output, with the first two containing the calculated values of point and line parameters for all areas and selected parameters

Output attribute table for the first step of the calculation:

FID	Shape *	Id	Ref ID	Period
0	Multipoint	0	FR	2010
1	Multipoint	0	HR	2010
2	Multipoint	0	BE	2010
3	Multipoint	0	BG	2010
4	Multipoint	0	CZ	2010
5	Multipoint	0	DK	2010
6	Multipoint	0	EE	2010
7	Multipoint	0	FI	2010
8	Multipoint	0	NL	2010
9	Multipoint	0	FR	2011
10	Multipoint	0	HR	2011
11	Multipoint	0	BE	2011
12	Multipoint	0	BG	2011
13	Multipoint	0	CZ	2011
14	Multipoint	0	DK	2011
15	Multipoint	0	EE	2011
16	Multipoint	0	FI	2011
17	Multipoint	0	NL	2011
18	Multipoint	0	FR	2012
19	Multipoint	0	HR	2012
20	Multipoint	0	BE	2012
21	Multipoint	0	BG	2012
22	Multipoint	0	CZ	2012
23	Multipoint	0	DK	2012
24	Multipoint	0	EE	2012
25	Multipoint	0	FI	2012
26	Multipoint	0	NL	2012



Ref_ID: contains the category from the original attribute table that was entered in the "Reference category" field

Period: contains a number that describes the calculation period

2. Classification:

- for the calculation it is necessary to have an equilateral triangle divided into zones
 - basic sample triangles are included in the folder
 - the user has the option to divide the triangle according to their own requirements in the ArcMap environment

ArcMap input form for the second calculation step:

2. Classification

Zones
 Category field
 Plotted points
 Name of new field
 Layer to write categories
 Output Reference category

- Zones – the input layer of the created (selected) triangle, which contains the zones
- Category field – a category that describes the individual zones in the attribute table of the sample triangle
- Plotted points – the point layer created in the previous step
- Name of new field – name (prefix) of the newly created column, which will contain the assigned category from the triangle (e.g. types)
- Layer to write categories – the layer in which the results will be written (i.e. the zones of the triangle), most often the original layer entering the calculation
- Output Reference category – the name of the category that is used to match the calculated points from the first step of the calculation - the results are stored in columns and not in rows
 - it is the same category that was entered in the "Reference category" field in the first step of the calculation
- The output is the entry of the zones of the selected triangle in the attribute table, while a separate column is created for each period (the name of the newly created column consists of the name entered in "Name of new field", delimiter "_" and the corresponding period)

Output attribute table for the second calculation step:

FID	Shape *	NUTS ID	NAME LATN	typy 2010	typy 2011
0	Polygon	FR	France	12	7
1	Polygon	HR	Croatia	12	7
2	Polygon	BE	Belgium	7	12
3	Polygon	BG	Bulgaria	12	12
4	Polygon	CZ	Czechia	12	12
5	Polygon	DK	Danmark	7	7
6	Polygon	EE	Estonia	12	12
7	Polygon	FI	Finland	7	7
8	Polygon	NL	Netherland	12	12

Notes

- the output layer from the modified algorithm allows joint continuation within one layer or creation of several layers
 - the results from the first step of the calculation (points) are stored in one output file – this allows (according to the selected analysis) to sort the calculated points by period or by areas
- missing data in the attribute table is not an obstacle to the calculation (in any of the calculations)